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To:	Examiner Peter Lish	From:	Phillip Decker
Firm:	Art Unit 1754	Date:	September 29, 2003
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Joanna L. Duncan,
Christopher R. McLarnon, and Francis R. Alix
Serial No.: 09/683,267
Confirmation No.: 3355
Filed: 12/06/2001
For: NOx, Hg, AND SO2 REMOVAL USING AMMONIA

Examiner: Peter Lish

Group Art Unit: 1754

Commissioner for Patents
P.O. Box 1450
Arlington, VA 22313-1450

Dear Sir:

This correspondence is to supply replacement claim sheets, pages 2 - 6 of the Applicants' amendment of 8/26/2003. These replacement sheets are provided at the suggestion of the Office who advised the Applicants that the claims were not submitted in accordance with the new amendment format.

Phillip E. Decker
Attorney for Applicants

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the Commissioner for Patents (Fax No. 703-305-6078) on September 29, 2003.

Typed or printed name of person signing this certificate: Phillip E. Decker.

Signature: _____

1. (currently amended) A process for removing SO_2, NO, and NO_2 from a gas stream comprising the steps of

a. oxidizing at least a portion of NO in a gas stream to NO_2 with an oxidizing means resulting in a mole ratio of SO_2 to NO_2 of at least 2.5 to 1, followed by

b. scrubbing at least a portion of SO_2, NO, and NO_2 from the gas stream with a scrubbing solution

comprising ammonia, and

having a pH between 6 and 8, and

c. removing at least a portion of any ammonia aerosols generated from the scrubbing step from the gas stream with an aerosol removal means.

2. (original) The process of claim 1, wherein said oxidizing means is an electrical discharge reactor.

3. (original) The process of claim 2, wherein said electrical discharge reactor is a dielectric barrier discharge reactor.

4. (original) The process of claim 3, further comprising the step of oxidizing at least a portion of the NO to HNO_3 with said dielectric barrier discharge reactor.

5. (canceled)

6. (original) The process of claim 1, wherein said oxidizing step is adapted to result in a mole ratio of SO_2 to NO_2 of at least four to one.

7. (original) The process of claim 1, said scrubbing solution comprising ammonia, ammonium sulfite, ammonium sulfate, and water, and having a pH between 6 and 8.

8. (original) The process of claim 1, wherein said aerosol removal means is a wet electrostatic precipitator.

9. (original) The process of claim 1, wherein said scrubbing step results in the formation of ammonium sulfate, the process further comprising the step of withdrawing ammonium sulfate from the scrubbing solution.

10. (original) The process of claim 4, wherein said scrubbing step results in the formation of ammonium nitrate, the process further comprising the step of withdrawing ammonium nitrate from the scrubbing solution.

11. (original) A process for removing SO_2, NO, NO_2, and Hg from a gas stream comprising the steps of

a. oxidizing at least a portion of the NO in a gas stream to NO_2, and at least a portion of the Hg in a gas stream to HgO, with an oxidizing means, followed by

b. scrubbing at least a portion of the SO_2, NO, and NO_2 from the gas stream with a scrubbing solution

comprising ammonia, and

having a pH between 6 and 8, and

c. removing at least a portion of any ammonia aerosols generated from the scrubbing step, and HgO, from the gas stream with an aerosol removal means.

12. (original) The process of claim 11, wherein said oxidizing means is an electrical discharge reactor.

13. (original) The process of claim 12, wherein said electrical discharge reactor is a dielectric barrier discharge reactor.

14. (original) The process of claim 11, wherein said aerosol removal means is a wet electrostatic precipitator.

15. (original) The process of claim 11, said scrubbing solution

comprising ammonia, ammonium sulfite, ammonium sulfate, and water, and

having a pH between 6 and 8.

16. (original) The process of claim 15, wherein said scrubbing step results in the formation of ammonium sulfate, the process further comprising the step of withdrawing ammonium sulfate from the scrubbing solution.

17. (withdrawn) An apparatus for removing SO_2, NO, and NO_2 from a gas stream comprising

a. an oxidizing means for oxidizing at least a portion of the NO in a gas stream to NO_2, followed by

b. a scrubber suitably adapted to scrub at least a portion of the SO_2, NO, and NO_2 from the gas stream with a scrubbing solution

comprising ammonia, and

having a pH between 6 and 8, and

c. an aerosol removal means for removing at least a portion of any ammonia aerosols generated by the scrubber from the gas stream.

18. (withdrawn) The apparatus of claim 17, wherein said oxidizing means is at least one electrical discharge reactor.

19. (withdrawn) The apparatus of claim 18, wherein said electrical discharge reactor is at least one dielectric barrier discharge reactor.

20. (withdrawn) The apparatus of claim 19, wherein said dielectric barrier discharge reactor is adapted to oxidize at least a portion of the NO to NO_2 and HNO_3.

21. (withdrawn) The apparatus of claim 17, said scrubbing solution

comprising ammonia, ammonium sulfite, ammonium sulfate, and water, and

having a pH between 6 and 8.

22. (withdrawn) The apparatus of claim 17, wherein said aerosol removal means is at least one wet electrostatic precipitator.

23. (withdrawn) An apparatus for removing SO_2, NO, NO_2, and Hg from a gas stream comprising

a. an oxidizing means for oxidizing at least a portion of the NO in a gas stream to NO_2, and at least a portion of the Hg in a gas stream to HgO, followed by

b. a scrubber suitably adapted to scrub at least a portion of the SO_2, NO, and NO_2 from the gas stream with a scrubbing solution

comprising ammonia, and

having a pH between 6 and 8, and

c. an aerosol removal means for removing at least a portion of any ammonia aerosols generated by the scrubber, and HgO, from the gas stream.

24. (withdrawn) An apparatus for removing SO_2, NO, and NO_2 from a gas stream comprising

a. an NO oxidizer adapted to xidize at least a portion of the NO in a gas stream to NO_2, followed by

b. a scrubber adapted to scrub at least a portion of the SO_2, NO, and NO_2 from the gas stream with a scrubbing solution

comprising ammonia, and

having a pH between 6 and 8, and

c. an aerosol remover adapted to remove at least a portion of any ammonia aerosols generated by the scrubber from the gas stream.

25. (withdrawn) The apparatus of claim 24, wherein said NO oxidizer is at least one electrical discharge reactor.

26. (withdrawn) The apparatus of claim 25, wherein said electrical discharge reactor is at least one dielectric barrier discharge reactor.

27. (withdrawn) The apparatus of claim 26, wherein said dielectric barrier discharge reactor is adapted to oxidize at least a portion of the NO to NO_2 and HNO_3.

28. (withdrawn) The apparatus of claim 24, said scrubbing solution

comprising ammonia, ammonium sulfite, ammonium sulfate, and water, and

having a pH between 6 and 8.

29. (withdrawn) The apparatus of claim 24, wherein said aerosol remover is at least one wet electrostatic precipitator.